CLAIMS

We claim:

1. A low impedance band-gap reference circuit, comprising:

a band-gap reference circuit;

a buffer circuit electronically coupled with said band-gap reference circuit; and

a voltage pull-up device electronically coupled with said band-gap reference circuit and said buffer circuit, wherein said voltage pull-up device acts to reduce a required supply voltage to maintain a band-gap reference voltage.

2. A band-gap reference circuit as described in Claim 1, wherein said band-gap reference circuit resides in an integrated circuit device.

3. A band-gap reference circuit as described in Claim 1, wherein said band-gap reference circuit is implemented in a silicon substrate.

4. A band-gap reference circuit as described in Claim 1, wherein said buffer circuit is implemented as a transistor.

5. A band-gap reference circuit as described in Claim 1, wherein said voltage pull-up device is a resistor.

6. A band-gap reference circuit as described in Claim 1, wherein said voltage pull-up device is a transistor.

7. An electronic device, comprising:

a silicon substrate;

electronic circuitry constructed in said silicon substrate; and

a band-gap reference circuit electronically coupled in said electronic device, wherein said electronic circuitry requires reference to the output voltage of said band-gap reference circuit and said band-gap reference circuit is enabled for low impedance.

8. An electronic device as described in Claim 7, wherein said electronic device is an integrated circuit device.

9. An electronic device as described in Claim 7, wherein said band-gap reference circuit is enabled for low impedance by a buffer circuit.

10. An electronic device as described in Claim 9, wherein said buffer circuit is implemented as a transistor circuit.

Sub A3

11. An electronic device as described in Claim 10, wherein said transistor circuit is connected as an emitter follower.

12. An electronic device as described in Claim 7, wherein said band-gap reference circuit is enabled for low supply voltage.

Sub B1

13. An electronic device as described in Claim 12, wherein said band-gap reference circuit is enabled for said low supply voltage by a voltage pull-up device.

14. An electronic device as described in Claim 13, wherein said voltage pull-up device is a resistor.

15. An electronic device as described in Claim 13, wherein said voltage pull-up device is a transistor.

Sub A4

16. In an electronic device, a method for providing a reference voltage, comprising:

flowing current through an electronic element such that the band-gap voltage of said electronic element provides said reference voltage;

providing a buffer circuit enabled to provide low impedance; and

adjusting the voltage across said buffer circuit so that said band-gap reference voltage is maintained.

17. A method as described in Claim 16, wherein said electronic device is an integrated circuit device.

18. A method as described in Claim 16, wherein said buffer circuit is implemented as a transistor circuit.

19. A method as described in Claim 18, wherein said transistor circuit is connected as an emitter follower.

20. A method as described in Claim 16, wherein said band-gap reference circuit is enabled for low supply voltage.

21. A method as described in Claim 20, wherein said band-gap reference circuit is enabled for said low supply voltage by a voltage pull-up device.

22. A method as described in Claim 21, wherein said voltage pull-up device is a resistor.

23. A method as described in Claim 21, wherein said voltage pull-up device is a transistor.